

Ovarian hyperstimulation syndrome as a cause of acute limb ischemia


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ABSTRACT

Ovarian hyperstimulation syndrome (OHSS) is an iatrogenic condition that can cause significant morbidity and mortality. Patients may present with a range of symptoms, including abdominal pain and distention, nausea, and vomiting that can rapidly progress to hemodynamic instability, renal failure, severe electrolyte derangements, thromboembolism, large-volume ascites, pleural effusion, and respiratory failure. We present a case of an 18-year-old woman who developed OHSS after egg donation with subsequent lower-extremity arterial thrombosis and compartment syndrome requiring fasciotomy and vascular intervention. Thus, knowledge and rapid recognition of OHSS are vital in improving patient outcomes.

KEYWORDS Assisted reproductive technology; limb ischemia; ovarian hyperstimulation syndrome

varian hyperstimulation syndrome (OHSS) is one of the most severe complications of assisted reproductive technology (ART) caused by an exaggerated response to controlled ovarian stimulation.¹ The overall incidence of OHSS is estimated to be 3% to 10% of all ART cycles.^{2,3} Less than 0.1% of patients have critical OHSS, which includes complications such as tense ascites, massive hydrothorax, acute renal failure, venous and arterial thrombosis, and acute respiratory distress syndrome.^{1,2,4} We present a case of a woman who developed OHSS after egg donation with subsequent hypercoagulability, lower-extremity arterial thrombosis, and compartment syndrome requiring fasciotomy and vascular intervention.

CASE PRESENTATION

An 18-year-old woman presented to the emergency department with gradually worsening lower abdominal pain, abdominal distention, nausea, vomiting, and shortness of breath. The patient was an egg donor, and on the day before her presentation, she had undergone egg retrieval at a fertility clinic. She had initially presented to an outside hospital with abdominal computed tomography (CT) showing markedly enlarged ovaries with multiple cystic lesions, extensive ascites, and a right-sided pleural fluid collection consistent with OHSS (*Figure 1*). She was transferred to our facility for

evaluation by a reproductive endocrinology and infertility specialist.

On arrival, her blood pressure was 121/86 mm Hg with a heart rate of 117 beats/min, respiratory rate of 18 breaths/min, oxygen saturation of 94%, and temperature of 98.6 °F. On physical exam, she had abdominal distention, lower abdominal tenderness, and bilateral pitting edema. The laboratory workup identified leukocytosis (31,900/μL), sodium of 134 mEq/L, lactic acid of 4.6 mmol/L, and D-dimer of 2.88 mcg/mL. Venous duplex ultrasound of the bilateral lower extremities did not show any evidence of deep vein thrombosis.

During her stay in the emergency department, the patient developed increasing right lower-extremity pain. Her right foot appeared mottled with no dorsalis pedis or posterior tibial pulses present on Doppler. She was taken emergently for a right lower extremity angiogram by interventional radiology and diagnosed with an occluded right external iliac and right popliteal artery. Vascular surgery subsequently performed a right lower-extremity thrombectomy, and she required admission to the surgical intensive care unit for frequent vascular checks and heparin drip administration. Unfortunately, she developed compartment syndrome in the right lower extremity requiring fasciotomy and multiple washouts. She did experience rethrombosis of the right posterior tibial artery and

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Figure 1. CT of the abdomen and pelvis demonstrating enlargement of the bilateral ovaries with multiple blood/fluid levels consistent with a previous follicular puncture and ovum harvest. Hemoperitoneum is also present, which likely reflects a ruptured hemorrhagic cyst. Additionally, there is right-sided tension hydrothorax.

required three repeat thrombectomies. Additionally, she required bilateral chest tube placement for her pleural effusions and repeated paracentesis for ascites. She ultimately progressed well and was able to be discharged home with 3 months of anticoagulation.

DISCUSSION

Ovarian stimulation produces an excess of proinflammatory cytokines, which causes arteriolar vasodilation and increased capillary permeability, ultimately resulting in fluid shifting from the intravascular to extravascular space.^{2–4} The third spacing of fluid leads to the development of ascites, intravascular hypovolemia, lower-extremity edema, and decreased renal perfusion. Hypovolemia additionally causes hemoconcentration and thus hypercoagulability and predisposition to thrombotic events.³

Venous thromboembolism is the most common thromboembolic complication with OHSS in 0.8% to 2.4%

of cases.^{5,6} Arterial thrombotic complications are rare and present as an earlier complication compared to venous complications.^{6,7} Preexisting hypercoagulable states can increase these risks. However, testing for most of these conditions is not reliable in the setting of acute thrombosis, so testing needs to be done before ART or after the resolution of the acute thrombosis.

Treatment of OHSS is mainly supportive. The course is usually self-limiting and mirrors the decline in serum human chorionic gonadotropin.² While mild and moderate cases are appropriate for outpatient management, severe OHSS requires optimizing fluid balance, including early fluid replacement to maintain intravascular perfusion, improving hemodynamics, and providing respiratory support.² Initiating prophylactic anticoagulation with low-molecular-weight heparin is also vital in treatment.⁴ Overall, early consultation with obstetrics and gynecology is critical.

Considering that ART is becoming increasingly prevalent, physicians need to develop an awareness of the complications related to these techniques. In addition, physicians need to recognize OHSS early and initiate supportive management to improve patient outcomes and prevent devastating complications, including arterial thromboses.

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